PERSPECTIVE

DIVERSITY/INCLUSION IN MICROBIOLOGY AND SCIENCE POLICY

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THE CHALLENGE AND THE POWER OF DIVERSITY

A few years ago, I read an illuminating book by social psychologist Claude Steele, with the intriguing title of *Whistling Vivaldi: How Stereotype Affect Us And What We Can Do*[1] . The book presents overwhelming evidence from solid scholarly behavioral research on the implicit biases that reside inside all of us. Steele is African-American and the title of his book derives from a story told him by Brent Staples, an African-American friend who had been a graduate student at the University of Chicago.

Staples observed that while walking at night through the streets of Chicago's Hyde Park neighborhood wearing a hoodie, oncoming pedestrians would cross the road so as not to be on the same sidewalk. To them, there was something threatening about a young black man in casual clothing at night in a sketchy neighborhood. However, when Staples— the same young black man, in the same outfit, at the same time, and in the same neighborhood— tried cheerfully whistling the "Spring" tune from Vivaldi's "Four Seasons," passersby were much friendlier. They would say hello, and wouldn't cross the road.

The abundant evidence provided in Steele's book which spans enormous breath of situations and stereotypes, is solidly data-driven, based on the results from many controlled behavioral experiments that testify to these widespread biases. Steele's point is not merely that negative biases exist—he says there are noxious biases about virtually every group in American life—young, old, male, female, Northerners, Southerners, geeks, jocks, or Californians— but often the real damage is internal for the person on the receiving end. Self-worth and personal-expectations fall. The problem is especially serious when someone is made to feel out-of-place and under suspicion like an inner city minority student on a college campus that seems populated only by privileged whites. A dynamic is set up, says Steele, where these individuals systematically underperform when compared to their already demonstrated potential.

This is a real and difficult problem to address, particularly in science education. By not fostering a diversified and multi-cultural environment, we lose talent because individuals cannot express or perform as well as they could. The power of diversity is that it creates better groups, better schools, and ultimately a better society. Stereotypes are deeply rooted in our society.

The challenge is to recognize them and to act. If you think that you are immune to bias, think again, your immune system may be working hard to fight it, but the antigen is certainly around. Try taking the Harvard Implicit Association Test (IAT) [link to WEBSITE https://implicit.harvard.edu/implicit/demo/], it takes about five minutes. IAT is a very solid instrument literally taken by hundreds of thousands of people; it is a very robust and validated instrument. It is illuminating to see what kind of biases may be creeping into your daily life.

Diversity produces benefits, although it can be hard to look beyond the snap biases that Steele shows so clearly envelop our daily lives. We know on one level that people from different identity groups or cultures bring different tools, ways of thinking and of solving problems to society. And yet rather than leveraging those differences for the collective benefit, we often allow them to impede progress and innovation. Certainly leveraging diversity is not an easy job. The political scientist Robert Putnam presents data indicating that the level of civic engagement and general trust decreases

when communities become more diverse. The problem is compounded; not only do people trust *other* groups less, they trust people within *their own* group less.

However, other researchers, most notably the mathematician, economist, "decision scientist," Scott Page, author of the wonderful book *The Difference*[2] builds on organizational theorist I.D. Steiner's work providing us with an interesting conceptual framework. When we are tasked to do something as a group, we need to analyze the nature of the assignment. Is it a *disjunctive* task where only one person needs to succeed in the group for the whole group to succeed or is it a *conjunctive* task, when everyone's contribution is critical? A group tackling a complex math problem is an example of a disjunctive task. The more diverse the thinking, the easier, it is for the team to solve the problem. Football, though, is a conjunctive task. The offensive linemen must complete their task of protecting the quarterback or the quarterback cannot succeed in his assignment. If a lineman fails to do his job, the quarterback gets sacked.

So, the more we can deal with disjunctive tasks, the easier it will be to leverage diversity and differences. The problem in bioscience is that tasks are rarely either disjunctive or conjunctive, but a mix of the two. The trick is to transform conjunctive tasks into disjunctive tasks. The best example is possibly crowdsourcing and the greatest current example is Wikipedia where distributed problem solving can be a powerful source of innovation. So, in this framework, where decentralized problem-solving and innovation go hand-in-hand, diversity deserves some credit. We have to think of sharing ideas—and sharing our scientific community—not as protecting privileged information or advantages but as building a collective scientific enterprise, a lever large enough to lift the world, as Archimedes said.